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SYNTHESIS

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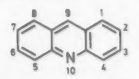

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- Cyclization Reactions 718
- Diarylamines
- Synthesis 171
- *N*-Heterocyclic *C*-Amino Compounds
- Synthesis 337 (6600)
- Nucleophilic Displacement of the Amino Group 604 (6670)
- *S*-Heterocyclic *C*-Amino Compounds
- Synthesis 337 (6600)
- 1-Methylalkanamines
- Synthesis 723
- 2-Nitro-1-alkenamines
- Synthesis 489
- Primary Allylic Amines
- Synthesis 685 (review)
- Primary Amines
- Synthesis 38, 538, 767 (6697), 953 (6745), 1052 (6767)
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- Reaction with Pyrylium Salts 507
- Sulfonyloxylation 34
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- *N*-Tosylalkanamines
- Synthesis 78 (6521)
- Tris[dialkylamino]-methanes
- Synthesis 905
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- Sterically Hindered Quaternary Ammonium Salts
- Synthesis 920
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- α-Acylaminocarboxylic Esters
- Synthesis 1042
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- Thiohydantoin Formation 391
- α-Aminocarboxylic Esters
- Resolution of Optical Isomers 1041
- β-Aminocarboxylic Esters
- Synthesis 84 (6544)
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- α-Amino-α-methylcarboxylic Esters
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- *N*-(9-Fluorenylmethoxycarbonyl)-amino Acids
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- Synthesis 788
- Isovaline
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- Synthesis 669 (L)
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- Synthesis 669 (L)
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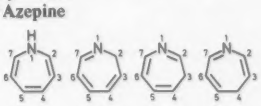
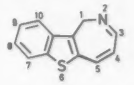
- Benzynes as Intermediates 502
● Azacrown Ethers
- Synthesis 992
● Azacrown Ethers containing Hexahydropyrazine Units
- Synthesis 847
● Azepine

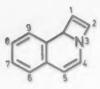


- 3,4,5,6-Tetrahydro-2*H*-azepines
- Ring Synthesis 1056 (6784)
● Azepino[4,3-*b*][1]benzothiophene



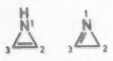
- 3-Oxo-2,3,4,5-tetrahydro-1*H* Der.
- Ring Synthesis 585, 1096
● Azete

- 3-Acyloxy-2-oxoazetidines
- Ring Synthesis 546
- 2-Hydroxylaminoazetidines
- Ring Synthesis 951
- 2-Oxoazetidines
- Ring Synthesis 12, 66, 428 (6628), 604 (6668), 833
- 1-Sulfonylazetidines
- Ring Synthesis 554
- 2-Oxo-1-sulfonylazetidines
- Ring Synthesis 516 (6650)
● Azeto[2,1-*a*]isoquinoline



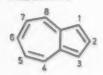
9b*H*-

- 2-Oxo-1,2,4,5-tetrahydro-9b*H* Der.
- Ring Synthesis 833
● Azido Compounds
- Reduction 953 (6745)
- *gem*-Alkoxyazidoalkanes
- Synthesis 500
- Aryloxyazidoacetic Esters
- Synthesis 568
- Azidoacetic Esters
- Synthesis 854 (6721)
- Azidoalkanes
- Synthesis 854 (6721)
- Reductive Alkylation 476
- 1-Azido-1-alkenes
- Reaction with Aryllithium 337 (6600)
- 1-Azido-2-alkenes
- Synthesis 689, 854 (6721)
- Reduction 689
- *C*-Azidomethyl Heterocyclic Compounds
- Synthesis and Reduction 689
- *gem*-Diazidoalkanes
- Synthesis and Cyclization Reactions 500
● Azines
- Synthesis 909
- 2-Benzylidenehydrazono-2*H*-1,3-thiazines
- Synthesis 828
● Azirine



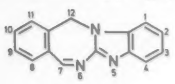
1*H*- 2*H*-

- 2*H*-Azirines
- Ring Cleavage 699
- 1-Acylaziridines
- Ring Cleavage 697
- Aziridines
- Ring Synthesis 330, 924
- Aziridine-2-sulfonic Acid Derivatives
- Ring Synthesis 816
- 2-Vinylaziridines
- Reductive Cleavage 697
● Azulene



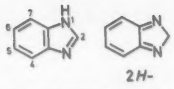
- 1,2,3,3a,4,8a-Hexahydroazulenes
- Ring Synthesis 525
- 1-Oxooctahydroazulenes
- Ring Synthesis 14, 432–436

● Benzenes and Derivatives
- Ring Synthesis 679 (6673)
- Benzoic Acid Esters
- Synthesis 110
- Ring Synthesis 97, 98, 102, 853 (6718)
- Homophthalic Esters
- Ring Synthesis 93, 98
- 2-Hydroxyacetophenones
- Ring Synthesis 171
● Benzimidazo[1,2-*b*][2,4]benzodiazepine



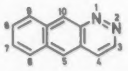
12*H*-

- 7,12-Dioxo-6,7-dihydro-12*H* Der.
- Ring Synthesis 870, 1096
● Benzimidazole

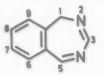


2*H*-

- 2-Acylaminobenzimidazoles
- Ring Synthesis 1033
- 2-Aminobenzimidazoles
- Synthesis 864 (review)
- Ring Synthesis 375, 861 (review)
- Anellation Reactions 161, 868 (review)
- Reactions 861, 864 (review)
- 2-Oxo-2,3-dihydrobenzimidazoles
- Ring Synthesis 1032
- 1-(1-Pyrrolyl)-benzimidazoles
- Ring Synthesis 757
● Benzo[*g*]cinnoline



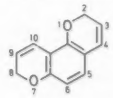
- 6,9-Diaminobenzo[*g*]cinnoline-5,10-quinones
- Ring Synthesis 32
● 2,4-Benzodiazepine



1*H*-

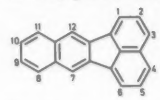
- 3-Acylamino-4,5-dihydro-1*H*-2,4-benzodiazepines
- Ring Synthesis 1034
● 1,3-Benzodioxole

- Synthesis 171
- Ring Cleavage 253, 255, 259, 261, 262, 265, 266, 268, 269, 271
● Benzo[1,2-*b*:3,4-*b*']dipyran



2*H*,8*H*-

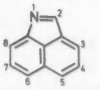
- 5-Hydroxy-3,4,9,10-tetrahydro-2*H*,8*H* Der.
- Ring Synthesis 404
● Benzo[*k*]fluoranthene



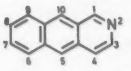
- Ring Synthesis 497
● 1-Benzofuran

- 4-Amino-2,3-dihydro-1-benzofurans
- Ring Synthesis 684 (6686)
- 4-Oxo-4,5,6,7-tetrahydro-1-benzofurans
- Ring Synthesis 175
- 2-Oxooctahydro-1-benzofurans
- Ring Synthesis 493
● 2-Benzofuran

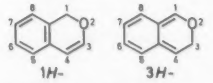
- 2-Benzofurans
- Synthesis and Ring Cleavage 1018
- 1,3-Dihydro-2-benzofurans
- Ring Synthesis 973
- Phthalides (1-Oxo-1,3-dihydro-2-benzofurans)
- Ring Synthesis 961, 984
- Bromination 1018
● Benzo[*cd*]indole



- 2-Oxo-1,2-dihydrobenzo[*cd*]indoles
- Ring Synthesis 972, 979
● Benzo[*g*]isoquinoline

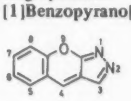


- 6,9-Diaminobenzo[*g*]isoquinoline-5,10-quinones
- Ring Synthesis 32
● 1-Benzopyran
see: Chromene
● 2-Benzopyran

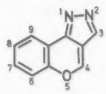


1*H*- 3*H*-

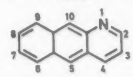
- 3,4-Dihydro-1*H*-2-benzopyrans
- Ring Synthesis 595
- 1,3-Dioxo-4-arylhydrazono-3,4-dihydro-1*H*-2-benzopyrans
- Synthesis and Reactions 421
- 3-Oxoisochromans
- Ring Synthesis 979
● [1]Benzopyrano[2,3-*c*]pyrazole



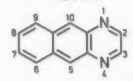
- 4-Oxo-1,4-dihydro Der.
- Ring Synthesis 214
● [1]Benzopyrano[4,3-*c*]pyrazole



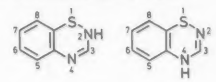
- 4-Oxo-1,4-dihydro Der.
- Ring Synthesis 214
● Benzo[*g*]quinoline



- 6,9-Diaminobenzo[*g*]quinoline-5,10-quinones
- Ring Synthesis 32
● Benzo[*g*]quinoxaline

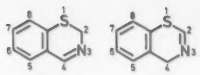


- 6,9-Diaminobenzo[*g*]quinoxaline-5,10-quinones
- Ring Synthesis 32
● 1,2,4-Benzothiadiazine



2*H*- 4*H*-

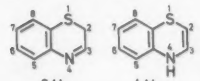
- 4*H*-1,2,4-Benzothiadiazine 1,1-Dioxides
- Ring Synthesis 851, 1096
● 1,3-Benzothiazine



2*H*- 4*H*-

- 2*H*-1,3-Benzothiazines
- Ring Synthesis 223
- 2*H*-1,3-Benzothiazinium Salts
- Synthesis 223

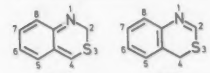
● 1,4-Benzothiazine



2*H*- 4*H*-

- 2*H*-1,4-Benzothiazines
- Ring Synthesis 755
- 4*H*-1,4-Benzothiazines
- Ring Synthesis 755
- 3-Alkylidene-3,4-dihydro-2*H*-1,4-benzothiazines
- Ring Synthesis 755
- 2-Alkylidene-3-oxo-2,3-dihydro-4*H*-1,4-benzothiazines
- Electrophilic Substitution at the Exocyclic Methylene Group 230, 1095

● 3,1-Benzothiazine



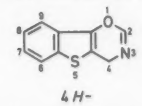
2*H*- 4*H*-

- 4-Thioxo-3,1-benzothiazines
- Ring Synthesis 619

● 1,3-Benzothiazole

- 1-(1,3-Benzothiazol-2-yl)-3-(1,3-benzoxazol-2-yl)-1,2-diphenylpropane
- Synthesis 144, 1094
- 1,3-Bis[1,3-benzothiazol-2-yl]-1,2-diphenylpropane
- Synthesis 144, 1094
- 2-(Pyrrolidin-3-yl)-1,3-benzothiazoles
- Synthesis 144, 1094
- 2-Styryl-1,3-benzothiazoles
- as Michael Acceptors 143

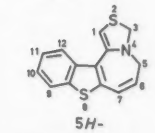
● [1]Benzothieno[2,3-*e*]-1,3-thiazine



4*H*-

- 2-Amino-4-oxo-4*H* Der.
- Ring Synthesis 929, 1096

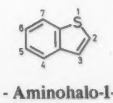
[1]Benzothieno[3,2-*c*][1,3]thiazolo[3,4-*a*]-azepine



5*H*-

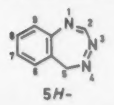
- 6-Oxo-1,6,7,12c-tetrahydro-5*H* Der.
- Ring Synthesis 586

● 1-Benzothiophene



- Aminohalo-1-benzothiophenes
- Synthesis 932

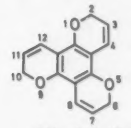
● 1,3,4-Benzotriazepine



5*H*-

- 5-Oxo-3,4-dihydro-5*H*-1,3,4-benzotriazepines
- Ring Synthesis 842

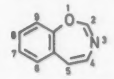
● Benzo[1,2-*b*:3,4-*b'*:5,6-*b''*]tripyran



2*H*-, 6*H*-, 10*H*-

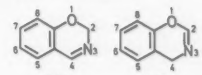
- 2-Oxo-7,8,11,12-hexahydro-2*H*,6*H*,10*H* Der.
- Ring Synthesis 405

● 1,3-Benzoxazepine



- Ring Synthesis 172

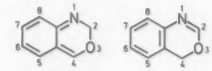
● 1,3-Benzoxazine



2*H*- 4*H*-

- 2,4-Dioxo-3,4-dihydro-2*H*-1,3-benzoxazines
- Ring Synthesis 172

● 3,1-Benzoxazine



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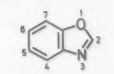
● 1,3-Benzoxazole



- 3-(1,3-Benzothiazol-2-yl)-1-(1,3-benzoxazol-2-yl)-1,2-diphenylpropane
- Synthesis 144, 1094
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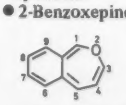

- 1,3,4,5-Tetrahydro-2-benzoxepines
- Ring Synthesis 595

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- Synthesis 511 (6631)
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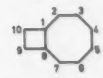
● Bicyclo[6.2.0]decane



- 9,9-Dichloro-10-oxobicyclo[6.2.0]decanes
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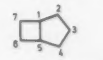
● Bicyclo[3.2.0]heptane



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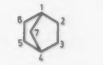
- Ring Synthesis and Transformation 1003

● Bicyclo[2.2.1]heptane (Norbornane)



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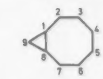
● Bicyclo[6.1.0]nonane



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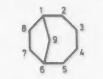
● Bicyclo[4.2.1]nonane



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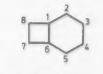

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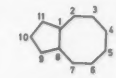

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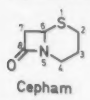

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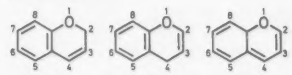

2*H*- 4*H*- 8a*H*-

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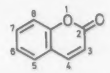

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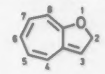

2*H*-

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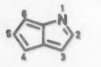

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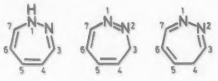

1*H*- 3*H*- 4*H*-

- 3-Amino-5-hydroxy-7-oxo-6-(3-oxo-3,4-dihydroquinoxalin-2-yl)-2,7-dihydro-1*H*-1,2-diazepine
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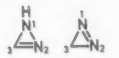

1*H*- 3*H*-

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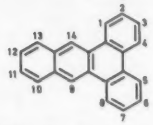
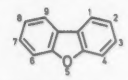


- Ring Synthesis 497
● Dibenzofuran



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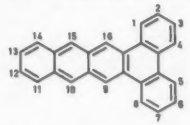

- Ring Synthesis 497
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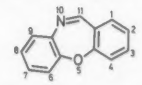

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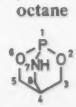

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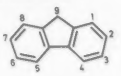

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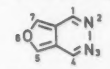
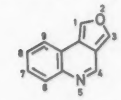


- Ring Synthesis and Cleavage 1018
● Furo[3,4-*c*]quinoline



- 4-Oxo-4,5-dihydro Der.
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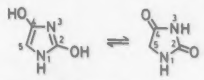

- 2-Thiohydantoins
- Synthesis 391
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- *N*-Acetyl-*N*-(2-alkenoyl)-*N'*-arylhydrazines
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- *N*-Alkyl-*N*-arylhydrazines
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- *N*-Alkyl-*N'*-sulfonylhydrazines
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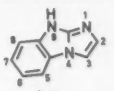
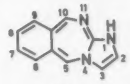


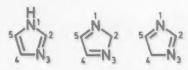
9*H*-

- 2-Oxo- and 2,3-Dioxo-2,3-dihydro-9*H* Der.
- Ring Synthesis and Reduction 870, 1033
● Imidazo[1,2-*b*][2,4]benzodiazepine



1*H*-

- 2-Oxo-2,3,5,10-tetrahydro-1*H* Der.
- Ring Synthesis 1034
● Imidazole



2*H*- 4*H*-

- Imidazoles
- Ring Synthesis 604 (6670)
- 2-Aminoimidazoles
- Anellation Reactions 161
- 4-Hydroxymethylimidazoles
- Ring Synthesis 576
- 4-Amino-4,5-dihydroimidazoles
- Ring Synthesis 940
- 4-Hydroxy-4,5-dihydroimidazoles
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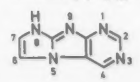
- Polyfluorinated 2,5-Dihydroimidazole Derivatives
- Ring Synthesis 177
- 2-Oxoimidazolidines
- Ring Synthesis 1032
- 4-Oxo-2-thioxoimidazolidines
- Ring Synthesis 391
● Imidazo[1,2-*f*]purine



- 2,4-Dioxo-1,2,3,4,6,7-hexahydro-8*H* Der.
- Ring Synthesis 577
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1*H*-

- 2,3,8,8a-Tetrahydro-1*H* Der.
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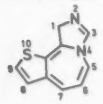
● Imidazo[1,5-*a*]thieno[2,3-*c*]azepine



1*H*-

- 3-Oxo-2,3,5,6,7,10b-hexahydro-1*H* Der.
- Ring Synthesis 586
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- α-Alkylthio- and α-Arylthioaldimines
- Synthesis 632
- 2-Amino-1-alkenyl Ketimines
- Cyclization Reactions 371
- Cyclic Imines
- Synthesis 1056 (6784)
- *vic*-Diketone Monoimines
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- 2-Hydroxybenzaldimines
- Synthesis 564
- Ketimines
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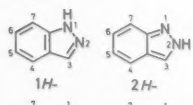
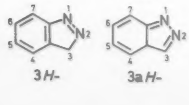
- *N*-Substituted 2,2,2-Trichloroethanimines (Chloral Imines)
- Synthesis 788
● Indazole

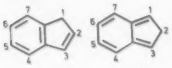


1*H*- 2*H*-



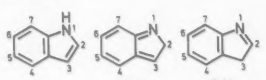
3*H*- 3a*H*-

- Ring Synthesis 852
● Indene



2*H*-

- Indanes
- Ring Synthesis 526
- 7-Hydroxy-2,4,5,6,7,7a-hexahydroindenes
- Ring Synthesis 164 (6551)
- 1-Oxo-2,3,4,5,6,7-hexahydroindenes
- Ring Synthesis 430–439
- 2-Oxo-2,4,5,6,7,7a-hexahydroindenes
- Ring Synthesis 523
● Indole



2*H*- 3*H*-

- Indoles
- Ring Synthesis 935
- Nitration 212
- 2-Aminomethylindoles
- Synthesis 156
- 2-Bromomethyl-1-phenylsulfonyl-3-phenylthioindole
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- Ring Synthesis 684 (6686)
- 2,3-Dihydroindoles
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- Cycloaddition Reactions 503
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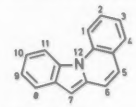
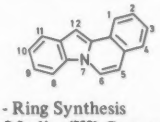
- Ring Synthesis 167 (6563)
- 6-Oxooctahydroindoles
- Ring Synthesis 524
● Indolo[1,2-*a*]quinoline



- Ring Synthesis 1039
● Indolo[1,2-*a*]isoquinoline



- Ring Synthesis 1039
● Iodine(III) Compounds
- Aryldifluoroiodine(III)
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- Iodosobenzene
- Reaction with Carboxamides 538
- Sulfonyliminoaryliodine(III)
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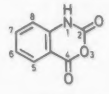

see: 3,1-Benzoxazine
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- Cyclization Reactions 593
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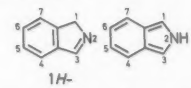
- Synthesis 956 (6754)
- Tosylmethyl Isocyanide
- Synthesis 140
● Isoindole



1*H*-

- 1,3-Dioxo-2,3-dihydro-1*H*-isoindoles
see: Dicarboxylic Acid Imides (Phthalimides)
● α-Isolupanine
- *N*-Methylation 920
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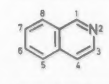

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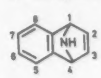
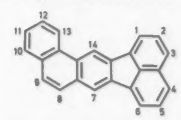


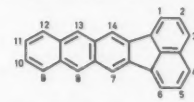
- Ring Synthesis and Transformation 502

● Naphtho[1,2-*k*]fluoranthene



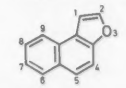
- Ring Synthesis 497

● Naphtho[2,3-*k*]fluoranthene



- Ring Synthesis 497

● Naphtho[2,1-*b*]furan



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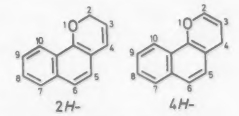
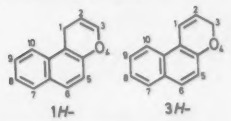
● Naphtho[1,2-*b*]pyran



- 2-Oxo-2*H*-Derivatives
- Ring Synthesis 978

● Naphtho[2,1-*b*]pyran



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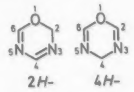

2*H*- 4*H*-

- Ring Synthesis 237

● **1,2,4-Oxadiazole**

- **1,2,4-Oxadiazoles**
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- **1,3,4-Oxadiazoles**
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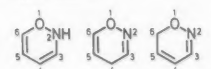
● **1,3-Oxathiole**

- **2-(1-Alkenyl)-1,3-oxathiolanes**
- Ring Synthesis 625

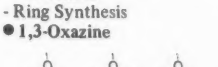
● **1,2-Oxazine**



2*H*- 4*H*- 6*H*-

- **6,6-Dialkoxy-5,6-dihydro-4*H*-1,2-oxazine 2-Oxides**
- Ring Synthesis 794

● **1,3-Oxazine**



2*H*- 4*H*- 6*H*-

- 2*H*-1,3-Oxazine(2-spiro-4')piperidines
- Ring Synthesis 564
● Oxazirine

- Oxaziridines
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5*H*-

- 3-Amino Der.
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11*H*-

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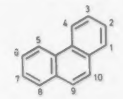

- 9,10-Dihydrophenanthrenes
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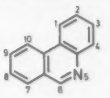

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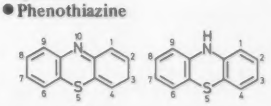
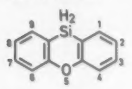


3*H*-

- 4-Oxo-1,2,3,4-tetrahydrophenothiazines
- Ring Synthesis 933

● Phenoxasilin



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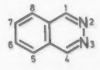
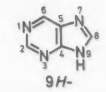
- Synthesis 69
- 2-Aryl-1-alkenephosphonic Esters
- Synthesis 556
- 2-Chloro-1-alkylthioalkanephosphonic Esters
- Synthesis and Reactions 332
- 2-Cyano-2-alkenephosphonic Esters
- Synthesis and Reaction with Aldehydes and Ketones 917
- 2-Cyano-2-silylethanephosphonic Esters
- Reactions 917
- Dialkyl-1-Acyl-2,2-dialkylthioethenephosphonates
- Synthesis and Reactions 449
- 3,6-Dioxoalkanephosphonic Esters
- Cyclization Reactions 242 (6571)
- 1-Formylalkanephosphonic Esters
- Synthesis 634
- 2,2-Dimethylpropanephosphonic Esters, 1-Functionally Substituted
- Synthesis and Reaction with Aldehydes 449
- 2-Oxoalkanephosphonic Esters
- Reaction with Aldehydes and Ketones 300
- Phenylmethanephosphonic Esters
- Oxidation 349
- 2-Siloxyalkanephosphonic Esters
- Synthesis 916
- 1-Thioureidoalkanephosphonic Esters
- Synthesis and Cleavage 812
● Phosphonic Acids
- 1-Aminoalkanephosphonic Acids
- Synthesis 812
● Phosphonium Salts
- *P*-(1-Aroyloxyalkyl)-triphenylphosphonium Salts
- Synthesis 247 (6589), 1095
- Benzyltriphenylphosphonium Salts
- Synthesis 1001
- 1,4-Bis[phosphonio]-butadiene Salts
- Synthesis 374
- *o*-Bis[phosphoniomethyl]-arenes
- Reaction with *o*-Quinones 497
● Phosphonothioic Acid Esters
- *O*-Alkyl *O*-Aryl Arenephosphonothioates
- Synthesis 731
- *O,O*-Dialkyl Phosphonothioates
- S/O Exchange 509
- *O,O*-Diaryl Arenephosphonothioates
- Synthesis and Transesterification 731
● Phosphonous Acid Esters
- Monoalkyl Phosphonites
- *P*-Alkylation and *P*-Arylation 71, 377
● Phosphoranes
- 1-Alkoxycarbonyl-2-oxo-3-alkenylidenetriphenylphosphoranes
- Synthesis and Reactions 1053 (6770) (6771)
- α-Aroyloxybenzylidenetriphenylphosphoranes
- Reaction with Aldehydes 247 (6589)
- Benzylidenetriphenylphosphoranes
- Reaction with Aldehydes 360
- 3-Oxo-2-triphenylphosphoranylidene-4-alkenoic Esters
- Synthesis and Reductive Alkylation and Arylation 1053 (6770)
- Triphenylphosphoranylideneacetic Esters
- Reaction with 2-Oxopentanedioic Esters 1010
- Reaction with 2,3-*O*-Protected Furanoses 200
- Reaction with Thioxo Compounds 84 (6544)
● Phosphoric Acid Esters
- Synthesis 509
- Alkyl Dihydrogen Phosphate Salts
- Synthesis 451
- Alkyl Dimethyl Phosphates
- Selective Demethylation 451
- Alkyl Vinyl Hydrogen Phosphates
- Synthesis 453
- Dialkyl Hydrogen Phosphate Salts
- Synthesis 451
- Dialkyl Methyl Phosphates
- Selective Demethylation 451
- Dialkyl Vinyl Phosphates
- Monodealkylation 453
- 3-Oxo-1-alkenyl Diphenyl Phosphates
- Synthesis and Reactions 827
- *O*-Phosphono-L-tyrosine
- Synthesis 30
- Triaryl Phosphates
- Synthesis 558
● Phosphoroselenoic Acid Esters
- Se/O Exchange 509
● Phosphorothioic Acid Esters
- S/O Exchange 509
● Phosphorous Acid Esters
- Dialkyl Silyl Phosphites
- Reaction with Oxiranes 916
- Phosphorous Diesters (or Salts)
- *P*-Arylation 69, 71
● Phthalazine



- 1,4-Dioxo-1,2,3,4-tetrahydrophthalazines
- Synthesis 792
- 1-Oxo-1,2-dihydrophthalazines
- Ring Synthesis 421
● Piperolide (Synthesis) 89
● Prephenic Acid (Synthesis) 96
● Prostanoid Precursors
- Synthesis 124, 440
● Purine

7*H*-



9*H*-

- 8-Aminocaffeines and -theophyllines
- Synthesis 577
- 8-Bromotheophylline
- Reactions 577
- 7,9-Disubstituted 8-Oxoadenines
- Synthesis 849
● Pyran

2*H*-

4*H*-

- 2-Oxo-2*H*-pyrans (2-Pyrones)
- Ring Synthesis 139, 853 (6718), 928
- Ring Transformation 853 (6718)
- 4-Trimethylsilylethynyl-4*H*-pyrans
- Synthesis and Reaction with Carbonyl Compounds 491
- Pyrylium Salts
- Ring Synthesis 828
- O/N Exchange 508
- Reaction with Trimethylsilylethynyllithium 491
- Ring Cleavage 1025
- 6-(1-Alkenyl)-5-alkoxycarbonyl-4-oxo-3,4-dihydro-2*H*-pyrans
- Ring Synthesis and Anellation Reactions 948
- 4-Hydroxy-2-oxo-5,6-dihydro-2*H* pyrans
- Ring Synthesis 91
- 4-Oxo-3,4-dihydro-2*H*-pyrans
- Ring Synthesis 84 (6542), 101
- Spiro-substituted 5,6-Dihydro-2*H*-pyrans
- Ring Synthesis 799

- Tetrahydropyrans
- Ring Cleavage 601 (6660)
- 2,2-Diallyltetrahydropyrans
- Ring Synthesis 737

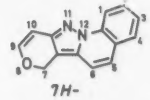
● Pyrano[2,3-*c*]pyrazole

- 1,6-Dihydro Derivatives
- Ring Synthesis 482, 852
- 4-Oxo-1,4,5,6-tetrahydro Der.
- Ring Synthesis 844

● Pyrano[4,3-*c*]pyrazole

- 3-Oxo-2,3,6,7-tetrahydro Der.
- Ring Synthesis 948

● Pyrano[4′,3′:3,4]pyrazolo[1,5-*a*]quinoline



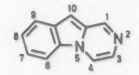
7*H*-

- 7-Oxo-5,6,9,10-tetrahydro-7*H* Der.
- Ring Synthesis 948

● Pyrazine

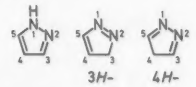
- Dihydropyrazine Derivatives as Intermediates in Asymmetric Amino Acid Synthesis 673, 675
- 2,5-Dioxohexahydropyrazines
- Ring Synthesis 516 (6651)
- Spirocyclic Hexahydropyrazine Derivatives
- Ring Synthesis 232

● Pyrazino[1,2-*a*]indole



- Ring Synthesis 1039

● Pyrazole



3*H*- 4*H*-

- Pyrazoles
- Ring Synthesis 928
- 5-(1-Alkenyl)-pyrazole-4-carboxylic Esters
- Ring Synthesis 566
- 3,5-Bis[1-alkenyl]-pyrazoles
- Ring Synthesis and Anellation Reactions 948
- 4-Hydroxypyrazoles
- Synthesis 1030
- Pyrazole-4-carboxylic Esters
- Ring Synthesis 1031
- 2-Oxo-2,3-dihydropyrazoles
- Ring Synthesis 239
- 5-Oxo-4,5-dihydropyrazoles
- Anellation Reactions 844
- 3-Alkylidene-5-oxopyrazolidines
- Ring Synthesis 479
- 4-Alkylidene-5-oxo-4,5-dihydropyrazoles
- Synthesis 482

● Pyrazolo[1,5-*a*]pyridine

- Ring Synthesis 1021

● Pyrazolo[3,4-*b*]pyridine

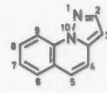
1*H*-

- 4,5,6,7-Tetrahydro-1*H* Der.
- Ring Synthesis 226, 1094

● Pyrazolo[1,5-*c*]pyrimidine

- 2,5-Dioxo-7-thioxo-1,2,3,5,6,7-hexahydro Der.
- Ring Synthesis 478

● Pyrazolo[1,5-*a*]quinoline



- 4,5-Dihydro Der.
- Ring Synthesis 566, 948

● Pyrazolo[1,5-*a*]quinoxaline

- 3-Nitroso-2,4-dioxo-1,2,4,5-tetrahydro Der.
- erroneous structural assignment 339, see 1095

● Pyrazolo[1′,5′:1,2]quinoxalino-[3,4-*c*][1,2,4]triazole

- 3-Nitroso-2-oxo-1,2-dihydro Der.
- erroneous structural assignment 339, see 1095

● Pyrethroid Acids

- Synthesis 1002

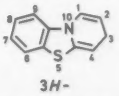
● Pyridazino[1,5-*a*]indole

- Ring Synthesis 1039

● Pyridine

- Pyridines
- 4-Substitution 684 (6687)
- 6-Amino-2-hydroxypyridines
- Ring Synthesis 740
- Cycloaliphatic-Fused Pyridines
- Ring Synthesis 428 (6629)
- Pyridine *N*-Oxides
- Cyanation 316
- Pyridinium Salts
- Synthesis 507
- 2-Alkoxycarbonylpyridinium Salts
- Synthesis and Ester Cleavage 150
- 1-Amino-2-alkylthiopyridinium Salts
- Anellation Reactions 1021
- 1-(1-Aroyloxyalkyl)-pyridinium Salts
- Synthesis 247 (6589)
- 2-Carboxypyridinium Betaines
- Synthesis and Reactions 150
- 3-Acetyl-2-thioxo-1,2-dihydropyridines
- Ring Synthesis 1025
- 6-Amino-4-alkoxycarbonyl-2-oxo-1,2-dihydropyridines
- Ring Synthesis 147
- 2-Oxo-1,2-dihydropyridines (2-Pyridones)
- Anellation Reactions 582
- 2-Thioxo-1,2-dihydropyridines
- Synthesis 149
- 1,4-Dihydropyridines
- Ring Synthesis 761
- 2,6-Dihydroxy-1,4-dihydropyridines
- Ring Synthesis 740
- 3-Formyl-4-oxo-1,4-dihydropyridines
- Ring Synthesis 946
- 1-Silyl-1,4-dihydropyridines
- Synthesis 684 (6687)
- 1,2,3,4-Tetrahydropyridines
- Ring Synthesis 532
- 1-Amino-4-oxo-1,2,3,4-tetrahydropyridines
- Synthesis 566
- 1-Amino-1,2,3,4-tetrahydropyridines
- Ring Synthesis 604 (6669)
- 2-Oxo-1,2,3,4-tetrahydropyridines
- Ring Synthesis 101
- 4-Oxo-1,2,3,4-tetrahydropyridines
- Ring Synthesis 101, 684 (6688)
- 2,3,4,5-Tetrahydropyridines
- Ring Synthesis 1056 (6784)
- 2,6-Dialkoxy-4-oxo-2,3,4,5-tetrahydropyridines
- Ring Synthesis 681 (6677)
- Piperidines
- Synthesis 604 (6669)
- 4-Oxopiperidines (4-Piperidones)
- Anellation Reactions 564

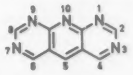
● Pyrido[2,1-*b*][1,3]benzothiazole



3*H*-

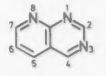
- 1-Amino-3*H* Der.
- Ring Synthesis 211

● Pyrido[2,3-*d*:6,5-*d*′]dipyrimidine



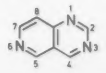
- 2,4,6,8-Tetraoxo-1,2,3,4,6,7,8,10-octahydro Der.
- Ring Synthesis 923

● Pyrido[2,3-*d*]pyrimidine



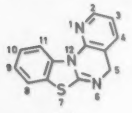
- 5,6,7,8-Tetrahydro Der.
- Ring Synthesis 226
- 2,4-Dioxo-2,3,4,8-tetrahydro Der.
- Ring Synthesis 75
- 2,4-Dithioxo-1,2,3,4,5,6,7,8-octahydro Der.
- Ring Synthesis 225

● Pyrido[4,3-*d*]pyrimidine



- 2,3,4,4a,5,6,7,8-Octahydro Der.
- Ring Synthesis 564

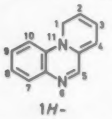
● Pyrido[3′,2′:5,6]pyrimido[2,1-*b*][1,3]-benzothiazole



5*H*-

- 5-Oxo-5*H* Der.
- Ring Synthesis 154

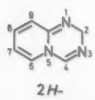
● Pyrido[1,2-*a*]quinoxaline



1*H*-

- 1,5-Dioxo-5,6-dihydro-1*H* Der.
- Ring Synthesis 1029

● Pyrido[1,2-*a*][1,3,5]triazine



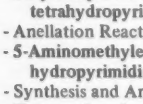
2*H*-

- 2,4,8-Trioxo-1,3,4,8,9,9a-hexahydro-2*H* Der.
- Ring Synthesis 593, 1096

● Pyrimidine

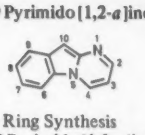
- Pyrimidines
- Ring Synthesis 717, 928
- 5-Acyl-2-alkylthiopyrimidines
- Ring Synthesis 956 (6755)
- 2-Amino-5-cyano-4-alkylthiopyrimidines
- Synthesis 402
- 2-Imino-1,2-dihydropyrimidines
- Ring Synthesis 409
- 2-Oxo- and 2-Thioxo-1,2-dihydropyrimidines
- Ring Synthesis 151
- 2-Amino-5-cyano-4-oxo-3,4-dihydropyrimidines
- Ring Synthesis 402
- 2-Amino-5-cyano-4-thioxo-3,4-dihydropyrimidines
- Ring Synthesis and Reactions 402
- 3-Amino-4-oxo-3,4-dihydropyrimidines
- Ring Synthesis 937
- 6-Amino-2,4-dioxo-1,2,3,4-tetrahydropyrimidines
- Anellation Reactions 76, 563
- 6-Hydroxy-5-nitroso-2,4-dioxo-1,2,3,4-tetrahydropyrimidines
- Anellation Reactions 563
- 5-Aminomethylene-2,4,6-trioxohexahydropyrimidines
- Synthesis and Anellation Reactions 923
- Tetraoxohexahydropyrimidines
- Synthesis 393

● Pyrimido[1,2-*a*]benzimidazole



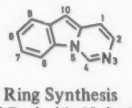
- Pyrimido[1,2-*a*]benzimidazoles
- Ring Synthesis 161, 875, 1094
- Partially Hydrogenated Imino-, Oxo-, and Hydroxy Der.
- Ring Synthesis 868–877, 1033

● Pyrimido[1,2-*a*]indole



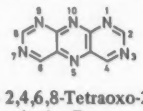
- Ring Synthesis 1039

● Pyrimido[1,6-*a*]indole



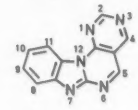
- Ring Synthesis 1039

● Pyrimido[5,4-*g*]pteridine



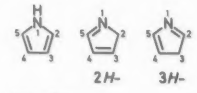
- 2,4,6,8-Tetraoxo-2,3,4,6,7,8,9,10-octahydro Der.
- Ring Synthesis 563

● Pyrimido[5′,4′:5,6]pyrimido[1,2-*a*]benzimidazole



- Ring Synthesis 871

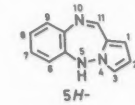
● Pyrrole



2*H*- 3*H*-

- Pyrroles
- Ring Synthesis 83 (6541), 532
- Cycloaddition Reactions 502
- 1-Alkoxypyrroles
- Ring Synthesis 590
- 1-Amino-3-aminocarbonylpyrroles
- Ring Synthesis 742
- Cycloaliphatic-fused Pyrroles
- Ring Cleavage 390
- 1-(2-Nitroanilino)-pyrrole
- Ring Synthesis and Further Reactions 757
- 1-Phenacylpyrroles
- Ring Synthesis 931
- 3,4-Dihydro-2*H*-pyrroles
- Ring Synthesis 1056 (6784)
- Pyrrolidines
- Ring Synthesis 144

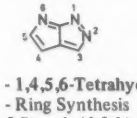
● Pyrrolo[1,2-*b*][1,2,5]benzotriazepine



5*H*-

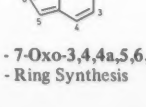
- Ring Synthesis 758

● Pyrrolo[2,3-*c*]pyrazole



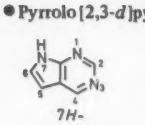
- 1,4,5,6-Tetrahydro Der.
- Ring Synthesis 227, 1094

● Pyrrolo[1,2-*b*]pyridazine



- 7-Oxo-3,4,4a,5,6,7-hexahydro Der.
- Ring Synthesis 153

● Pyrrolo[2,3-*d*]pyrimidine



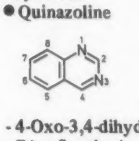
7*H*-

- 5,6-Dihydro-7*H* Der.
- Ring Synthesis 226
- 2,4-Dithioxo- and 2-Oxo-4-thioxo-1,2,3,4,5,6-hexahydro-7*H* Der.
- Ring Synthesis 225

● Quadrone
- Synthesis 19

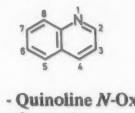
● Quaterphenyls
- Synthesis 468

● Quinazoline



- 4-Oxo-3,4-dihydroquinazolines
- Ring Synthesis 401
- 2,4-Dioxo-1,2,3,4-tetrahydroquinazolines
- Ring Synthesis 407

● Quinoline



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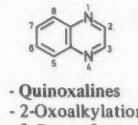
● Quinoxaline



- Quinoxalines
- 2-Oxoalkylation in the 2-Position 145
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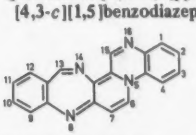

- Dioxotetrahydro Der.
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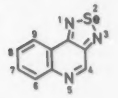

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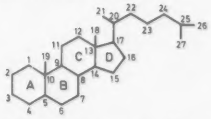

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- Ring Synthesis 478, 501

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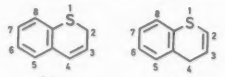
- Replacement of the *N*-Methyl Group by Other Alkyl Groups 809

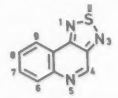
● **1-Thiachromene (1-Benzothiin)**



2*H*- 4*H*-

- Dithiochromones
- Synthesis 614
- Dithiocoumarins
- Synthesis 624

● **[1,2,5]Thiadiazolo[3,4-*c*]quinoline**



- Ring Synthesis 581

● **[1,3,4]Thiadiazolo[2,3-*c*][1,2,4]triazine**

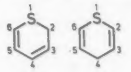
4*H*-

- 4-Oxo-4*H* Derivatives
- Ring Synthesis 759

● **Thialactones**
- Benzo-fused 2,3-Dioxo-4-alkene-5-thiolides
- Synthesis 393

● **Thiamin Derivatives**
- 6′-Methyl- and 6′-Ethylthiamin
- Synthesis 555

● **1-Thiapyran (Thiin)**



2*H*- 4*H*-

- Dithio-2-pyrones
- Ring Synthesis 614

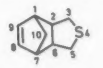
● **1,3-Thiaselenole**

- 2-Alkylthio-1,3-thiaselenolium Salts
- Reaction with Aldehyde Hydrazones 840

● **1,2,4,6,3,5-Thiatriazadiphosphorin**

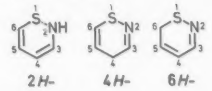
- 1,3,3,5,5-Pentachloro Der., 1-Oxide
- Ring Synthesis 369

● **4-Thiatricyclo[4.2.1.0^{2,6}]dec-8-enes**



- Ring Synthesis 680 (6674)

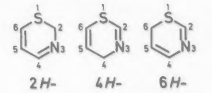
● **1,2-Thiazine**



2*H*- 4*H*- 6*H*-

- S^{VI}-1,2-Thiazine 1-Oxides
- Ring Synthesis 926

● **1,3-Thiazine**



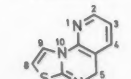
2*H*- 4*H*- 6*H*-

- 2-Thioxo-2*H*-1,3-thiazines
- Ring Synthesis 828
- $S^{\oplus}$-1,3-Thiazinium Salts
- Ring Synthesis 827

● **1,3-Thiazole**

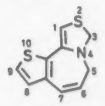
- 4-Hydroxy-1,3-thiazole-2-acetamide
- Ring Synthesis and Reactions 739
- 1,3-Thiazolium Salts
- Synthesis 555
- 4-Amino-1,3-thiazolium Salts
- Ring Synthesis 582
- 1,3-Thiazolium-4-aminides
- Ring Synthesis 582

● **[1,3]Thiazolo[3,2-*a*]pyrido[3,2-*e*]-pyrimidine**



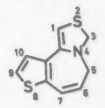
5*H*-

- 5-Oxo-5*H* Der.
- Ring Synthesis 154
● [1,3]Thiazolo[3,4-*a*]thieno[2,3-*c*]-azepine



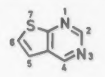
5*H*-

- 3-Oxo-1,6,7,10b-tetrahydro-5*H* Der.
- Ring Synthesis 586
● [1,3]Thiazolo[3,4-*a*]thieno[3,2-*c*]-azepine



5*H*-

- 3-Oxo-1,6,7,10b-tetrahydro-5*H* Der.
- Ring Synthesis 586
● Thieno[2,3-*d*]pyrimidine



- Ring Synthesis 402
● Thiocarbamic Acid Esters (Carbamothioic Acid Esters)
- *O*-Aryl Thiocarbamates
- Synthesis and Rearrangement 247 (6587)
- *S*-Arylthiocarbamates
- Synthesis and Reaction with Chlorine 247 (6587)
● Thiocarboxylic Acid Amides
- Cyclization Reactions 582
- Dehydrosulfurization 955 (6751)
- 2-Acyl-3-amino-2-alkenethioamides
- Synthesis 152
- Arenethiocarboxamides
- Synthesis 730
- α-Aryl-thioacetamides
- Synthesis 730
- Cyanothioacetamides
- Cyclization Reactions 402
- 3-Oxoalkanethioamides
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- Synthesis 81 (6535)
- *S*-Alkyl 2-Alkenethioates
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- *O*-Alkyl Thiocarboxylates
- Reaction with Hydroxylamine and *O*-Derivatives 220
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- *S*-Aryl Thiocarboxylates
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- Chlorofluorothioacetyl Fluoride
- Synthesis 170
● Thiocarboxylic Acids (or Salts)
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- Silver Thiocarboxylates
- *S*-Bromination and *S*-Iodination 552
● Thiocyanates
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- Aryloxythiocyanatoacetic Esters
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- 1-Alkenyl Aryl Sulfides
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- Synthesis 166 (6559), 603 (6667), 630, 751, 771 (6710)
- Cleavage 751
- *C*-Alkylthio-*N*-heteroarenes
- Synthesis 604 (6670)
- Alkyl Trifluoromethyl Sulfides
- Synthesis 765 (6691)
- *C*-Arylthio-*N*-heteroarenes
- Synthesis 604 (6670)
- 1,2-Bis[alkylthio]-1,3-alkadienes
- Synthesis 625
- 2,3-Bis[alkylthio]-1-phenylpropenes
- Synthesis and Hydrolysis 332
- Dialkyl Sulfides
- Synthesis 630
- Halomethyl Aryl Sulfides
- Cyclization Reactions 223
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- Arenethiols
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- Thiophenes
- Ring Synthesis 575
- 2-Aminomethylthiophenes
- Synthesis 73
- 2-Aminothiophenes
- Ring Synthesis 410
- 2,4-Diacyltetrahydrothiophenes
- Ring Synthesis 160
- 2-Oxotetrahydrothiophenes
- Ring Cleavage 1056 (6781)
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- *N*-Acylthioureas
- Synthesis and Cyclization Reactions 929
- 3-Mercapto-4-thioureido-4*H*-1,2,4-triazoles
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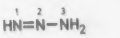

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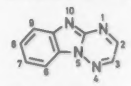
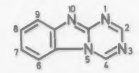


- Ring Synthesis 873
● [1,3,5]Triazino[1,2-*a*]benzimidazole



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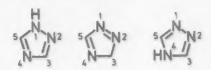

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- Ring Synthesis 44

● [1,2,4]Triazolo[4,3-*a*]pyrimidine

- Ring Synthesis 44

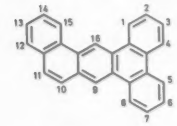
● [1,2,4]Triazolo[3,4-*b*]-1,3,4-thiadiazole

- Ring Synthesis 411

● [1,2,4]Triazolo[4,3-*b*][1,2,4]triazole

- Ring Synthesis 415

● Tribenzo[*a*,*c*,*h*]anthracene



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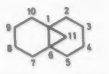

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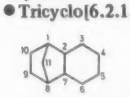

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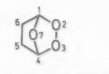

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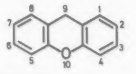

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● **Cycloaddition (intramolecular)**

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- 2-Alkylthio-3-anilinothiocarbonyl-4,5-dihydropyrroles or -1,4,5,6-tetrahydropyridines + Hydrazines 227
- 2-Aminomethylene-3-oxo-4-alkenoic Esters + Hydrazines 566
- to give N–C–N–C–C
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- Amidines + Enamines + Br_2 940
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- S–C–N + C–C
- Thiocarboxamides + α-Sulfonyloxyphenylacetonitriles 582
- S–C–C + N–C
- Mercaptoacetic Acid + Cyanoacetamide 739
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- 2-Aminobenzenethiols + Alkylidenemalononitriles 211
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- C–C–C + Te + N
- 1-Alkynyl Ketones + K_2Te + Hydroxylamine-*O*-sulfonic Acid 825
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- N–C–C + C–C
- (1-Alkenyl)-aryldiazenes + 3-Oxoalkanamides 742
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- 1,4-Alkanediones + Primary Amines 931
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- Bromomethyl Ketones + Methyl Ketones 49
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- S–C–C–C + C
- 5-Cyano-5-thioxo-3,4-dihydropyrimidines + Alkyl Chloroacetates 402
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- C–C–C + C–C
- 2-Alkenoyl Chlorides + 1-Silyl-1-alkenyl-Aryl Sulfides 765 (6690)
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- N–C + N + N + C + C
- Cyanamides + Alkanamines + Formaldehyde 222
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- to give S–N–C–N–C–C
- N–S–C–C–N + C
- 2-Aminobenzenesulfonamide + Carboxylic Acids 851
- to give N–N–C–C–C–C
- C–C–C–C + N–N
- 3-(2-Fluorophenyl)-3-oxopropanoic Esters + Arenediazonium Salts

- to give N–C–N–C–C–C
- N–C + N–C + C–C
- Isothiocyanates + Semicyclic Ketene *S,N*-Acetals 225
- N–C–N + C–C–C
- Amidines + 2-Acyl-3-alkylthio-3-aminopropenenitriles 928
- Amidines (or Guanidine) + 2-Alkylthio--3-anilinothiocarbonyl-4,5-dihydropyrroles or -1,4,5,6-tetrahydropyridines 227
- 2-Aminoimidazoles (or 2-Aminobenzimidazoles) + Malonic Aldehyde Tetraalkyl Acetals (or 3-Alkoxy-2-alkenals) 161
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- Isothioureas + Alkoxymethylene-1,3-Dicarbonyl Compounds 956 (6755)
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- Cyanoacetamide (or Cyanothioacetamide) + Alkyl *N*-Cyanocarboximidates 402
- N–C–N–C + C–C
- *N,N'*-Dibenzylideneaminals + 4-Oxopiperidines 564
- N–C–C–C + N–C
- 2-Alkylthio-3-anilinothiocarbonyl-4,5-dihydropyrroles + Isocyanates 225
- 2-Amino-1-alkenyl Ketones + Carbodiimides 409
- 2-Amino-1-alkenyl Ketones + Isocyanates or Isothiocyanates 152
- Anthranilic Acids + Dithiocarbamic Esters 407
- to give N–C–C–N–C–C
- N–C–C + N–C–C
- 4-Aminouracils + 5-Nitrosobarbituric Acids 563
- 2-Haloalkanamides + Base 516 (6651)
- to give O–C–N–C–C–C
- O–C–C–C–N + C
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- *N,N'*-Dibenzylideneaminals + Ketones (4-Oxopiperidines) 564
- to give S–C–N–C–C–C
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- S–C–C–N + C–C
- 2-Aminobenzenethiols + 1,3-Cycloalkanediones 934
- to give N–C–C–C–C–C
- C–C + C–C + N + C
- 3-Oxoalkanoic Esters + Ammonia + Aldehydes 761
- N–C–C + C–C–C
- Alkanamides + 2-Acyl-2-alkenenitriles 740
- Alkanamides + Benzylidenemalononitriles 740
- Alkanamides + 2-Cyano-2-alkenoic Esters 740
- 6-Amino-2,4-dioxo-1,2,3,4-tetrahydropyrimidines + 3-Chloro-2-alkenals 76
- N–C–C–C + C–C
- 2-Alkenamides + Cyanoacetic Esters 740
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- Cyanoacetyl Chloride + Enol Ethers (6677) 681
- C–C–C–C + N–C
- 1-Methoxy-3-siloxybutadiene + Aldimines 684 (6688)
- Sodium Enolates of 2-Alkene-1,5-diones + Isothiocyanates 1025
- C–C–C–C–C + N
- 2-Aminomethylene-3-oxo-4-alkenoic Esters + Hydrazines 566
- 5-Oxo-2-alkenals + NH_3 428 (6629)
- to give O–C–C–C–C–C
- O–C–C + C–C–C
- Alkyl Ketones + Methoxymethylenemalonic Esters 853 (6718)
- O–C–C–C–C + C–C
- 2-Hydroxybenzaldehyde + 3-Alkenoic Hydrazides 479
- 2-Hydroxybenzaldehydes + Nitroacetic Esters 836
- C–C–C–C + O–C
- 3-Oxo-4-alkenoic Esters + 2-Alkenoyl Chlorides 948
- O–C–C–C–C + C
- *o*-Hydroxyacetophenones + Carboxylic Esters 311
- *o*-Hydroxyaryl Ketones + Formaldehyde (+ Amines) 579
- to give S–C–C–C–C–C
- S–C–C + C–C–C
- Alkanedithioic Acids + 3-Chloro-2-alkenals or 2-Chloro-1-alkenyl Ketones 614
- 3-Oxoalkanedithioic Acids + 1-Alkynyl Ketones 614
- to give C–C–C–C–C–C
- C–C–C + C–C + C
- 1,3-Disiloxy-1,3-alkadienes (2x) + Orthocarboxylic Esters or Carboxylic Anhydrides 93
- 3-Oxoalkanoic Esters (2x) + Aminals 110
- C–C–C + C–C–C
- 1,3-Disiloxy-1,3-alkadienes + 2-Oxocyclohexanecarboxaldehyde Derivatives 93
- 2,4-Pentanedione, Self-condensation 171
- C–C–C–C + C–C
- *o*-Bis[phosphoniomethyl]-arene Salts + *o*-Quinones 497
- Butenone + Enamines 522
- 3-Oxo-4-alkenoic Esters + Cycloalkanone Enamines 715
- *o*-Phthaldialdehydes + 1,4-Alkanediones 1018
- to give N–C–N–C–C–C–C
- N–C–C–C–C–N + C
- *o*-Bis[methylamino]-benzenes + *N*-Acylcarbonimidic Dichlorides 1034

● **Cyclocondensation (intramolecular)**

- to give N–C–C
- 2-Amino-1-bromoalkanesulfonic Acid Derivatives + Amines 817
- to give O–C–C
- 2-Acyloxy-3-chloroalkanamides + Base 547
- to give N–C–C–C
- 3-Chloroalkanamides + CsF 546
- 3-Haloalkanamides + Base 516 (6652)
- to give O–C–N–N–C
- *N*-Acylhydrazonic Esters + DBU 239
- *N,N'*-Diacylhydrazines + $POCl_3$ or PPA 842
- to give N–N–C–C–C
- *N*-Acylformhydrazonic Esters, Thermal Cyclization 239
- α-Oximino-2-oxo-1,2-dihydroquinoxaline-3-acetic Hydrazide + HNO_2 399, 1095
- to give N–C–N–C–C
- 1-(2-Acylaminoanilino)-pyrroles + $POCl_3$ 757
- to give N–C–C–C–C
- 1-Amino-2-hydroxy-3-alkynes + $PdCl_2$ 83 (6541)
- α-Benzyl-*N*-heteroarene *N*-Oxides, Thermally 1037
- 4-Haloalkanamides + Base 516 (6652)
- 2,5-Hexanedione Bis[*O*-methyloximes] + Acid 591
- to give O–C–C–C–C
- 1,4-Alkanediols + Dimethyl Sulfoxide/Chlorotrimethylsilane 216
- 4-Alkoxy-2,3-alkadienols + Acid 683 (6685)
- 2-Bromophenyl Phenyl Ethers, Catalyzed Dehydrobromination 234
- to give C–C–C–C–C
- 1,4-Alkanediones + Base 887
- 2-Diazo-3-oxoalkanoic Esters + $Rh_2(OAc)_4$ 1050 (6762)
- 3,6-Dioxoalkanephosphonic Esters + NaH 242 (6571)
- 9,12-Dioxoalkanoic Esters + Base 124
- Hexanedioic Acids + KF 175
- to give N–C–N–C–C–C
- *N*-Acetyl-*N*-(2-alkenoyl)-*N'*-arylhydrazines, thermally 938
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- Alkylaminomethylenemalonic Esters, thermally 946
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- to give O–C–C–C–C–C
- *o*-(1-Acetoxyalkyl)-phenylacetaldehydes + Acid/Methanol 595
- 1,5-Alkanediols + Acid 737
- 1,5-Alkanediols + Dimethyl Sulfoxide/Chlorotrimethylsilane 216
- 4-(2-Alkenoyl)-5-hydroxypyrazoles + Acid 844
- 3-(2-Hydroxyphenyl)-2-alkenols + Acid 846
- 1,2,2,2-Tetrafluoroethyl 2-Hydroxyphenyl Ketones + Na_2S or NH_3 or Amines 396
- to give C–C–C–C–C–C
- 2,5-Alkadienals + Acid 467
- 2-Cyano-4-aryl-2-alkenoic Esters, thermally 505, 560
- Heptanedioic Acids + KF 175
- 5-Oxo-2-alkenals + Base 512 (6635)
- to give N–C–C–C–C–C–C
- 6-Haloalkanamides + Base 516 (6652)
- to give O–C–C–C–C–C–C
- 3-[2-(1-Acetoxyalkyl)-phenyl]-propanals + Acid/Methanol 595

● **Cyclodehydrogenation (intramolecular)**

- to give N–C–C–C–C
- *N*-(4-Alkenyl)-sulfonamides + $PdCl_2$ + Benzoquinone 167 (6563)
- to give O–C–C–C–C
- 2-Alkene-1,4-diols + Oxygen 860 (6742)
- 2-Methylene-1,4-alkanediols + MnO_2 248 (6590)

● **Cyclopropanation**

- Alkenes + Alkyl Diazoacetates 469
- Alkenes + Bromomalonic Esters 855 (6726)
- 2-Alkenoic Esters + Alkyl Diazoacetates 469
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- 2-Acyloxy-1-nitroalkyl Phenyl Selenides 921
- 2-Alkenyl Acetates 77 (6519)

● **Dealkoxycarbonylation**
- 3-Oxoalkanoic Esters 124, 1053 (6771), 1054 (6774)
● **Dealkoxylation**
- 2-Alkenyl Alkyl Ethers 953 (6743)
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- Phosphonic Acid Esters, Selective Dealkylation 453
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- Formamides 139
- 2-Hydroxylaminoalkanoic Esters 539
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- 2-Bromophenyl Phenyl Ethers 234
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- 1,2-Dibromoalkanesulfonic Acid Derivatives 817
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- using Metal Fluorides 170 (review)
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- using Metal Fluorides 170 (review)
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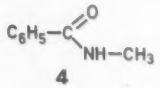
Errata and Addenda 1983

E. Haug, W. Kantlehner, P. Speh, H.-J. Bräuner, *Synthesis* **1983** (1), 35–37:

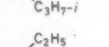
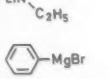
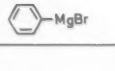
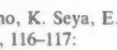
Compound **4** should be *N*-methylbenzamide:



4

A. I. Meyers, K. A. Lutomski, *Synthesis* **1983** (2), 105–107:
The first seven entries in the Table (p. 106) should be as follows:

Table. Addition of Organometallic Reagents to 2-(4,4-Dimethyl-4,5-dihydro-1,3-oxazol-2-yl)-1-methoxynaphthalene **(1)** leading to 1-Substituted 2-(4,4-Dimethyl-4,5-dihydro-1,3-oxazol-2-yl)-naphthalenes **2**

Product	RM	Yield [%]	m.p. [°C]	I.R. (film) $\nu_{C=N}$ [cm^{-1}]	^{1}H-N.M.R. (solvent) δ [ppm]
2a	H_3CLi	84	oil	1645	(CCl_4): 1.36 (s, 6 H); 2.92 (s, 6 H); 3.97 (s, 2 H); 7.3–8.2 (m, 6 H)
2b	*n*-C_4H_9Li	80	oil	1640	(CCl_4): 0.8–1.85 (m, 13 H); 3.45 (br, t, 2 H); 3.95 (s. 2 H); 7.3–8.2 (m, 6 H)
	n-C_4H_9MgBr	89			
2c		59	oil	1635	(CCl_4): 1.30 (s, 6 H); 3.92 (s, 2 H); 4.97 (s, 2 H); 7.0–8.2 (m, 12 H)
2d		68	oil[a]	1645	($CDCl_3$): 1.00 (d, 6 H); 1.12 (d, 6 H); 1.35 (s, 6 H); 3.45–4.19 (hept, 2 H); 4.0 (s, 2 H); 7.3–7.9 (m, 5 H); 8.65 (m, 1 H)
2e		78	oil[b]	1650	($CDCl_3$): 1.05 (t, 6 H); 1.35 (s, 6 H); 3.30 (d, 4 H); 3.95 (s, 2 H); 7.2–7.8 (m, 5 H); 8.3–8.5 (m, 1 H)
2f		84	oil	1660	(CCl_4): 1.12 (s, 6 H); 3.59 (s, 2 H); 7.2–7.9 (m, 11 H)

S. Takano, K. Seya, E. Goto, M. Hirama, K. Ogasawara, *Synthesis* **1983** (2), 116–117:

The title should read "Synthesis of (*S*)-1-*O*-Benzylglycerol and (*R*)-Benzyl 2,3-Epoxypropyl Ether from (*R*)-1-*O*-Benzylglycerol"; the names of compounds (*R*)-**5**, (*S*)-**5**, and **9** should be (*R*)-1-*O*-benzylglycerol, (*S*)-1-*O*-benzylglycerol, and (*S*)-2,3-Di-*O*-acetyl-1-*O*-benzylglycerol, respectively.

D. Michelot, *Synthesis* **1983** (2), 130–134:

The table under the formula scheme (page 131) should be as follows:

5	m	n	**6, 7, 8, (9)**	R
a	4	8	**a**	*n*-C_4H_9
a	4	8	**b**	C_2H_5
c		6	**c**	*n*-C_4H_9
a	4	8	**d**	H_2C=CH–
b	6	10	**e**	C_2H_5

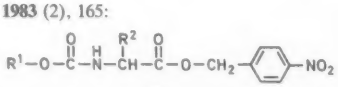
Compounds **6e**, **7e**, **8c**, and **9e** (p. 133) should be named (*Z*, *Z*)-1-(2-tetrahydropyranyloxy)-11,13-hexadecadiene, (*Z*,*Z*)-11,13-hexadecadienol, (*Z*,*Z*)-7,11-hexadecadien-1-yl acetate, and (*Z*,*Z*)-11,13-hexadecadienal, respectively. Compound **8b** is prepared from **5a** and ethylmagnesium bromide.

M. Künstlinger, E. Breitmaier, *Synthesis* **1983** (2), 161–162:

Compounds **5** and **6** should be named pyrimido[1,2-*a*]benzimidazoles.

Abstract **6555**, *Synthesis* **1983** (2), 165:

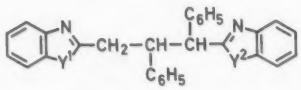
Compound **1** should be:



1

V. Dryanska, C. Ivanov, *Synthesis* **1983** (2), 143–145:

The formula for compounds **4g, h, 5g, h** (page 144) should be:



4g Y^1 = O, Y^2 = O
4h Y^1 = O, Y^2 = S
5g Y^1 = S, Y^2 = O
5h Y^1 = S, Y^2 = S

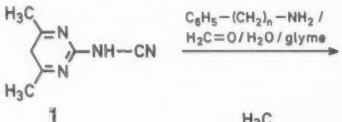
M. A. Brook, T. H. Chan, *Synthesis* **1983** (3), 201–203:

The following addendum should be added:
After publication of our work, our attention was drawn to the fact that the priority for the use of chlorotrimethylsilane for esterification lies with Nakao et al.[24].

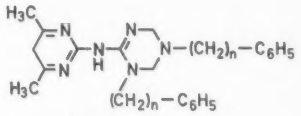
[24] R. Nakao, K. Oka, T. Fukumoto, *Bull. Soc. Chem. Jpn.* **54**, 1267 (1981).

C. W. Thornber, J. M. Farrell, D. S. Clarke, *Synthesis* **1983** (3), 222–223:

The formula scheme **1** ⟶ **10,11** (p. 222) should be:



1



10 n = 1
11 n = 2

H. Takahata, N. Nakajima, Y. Yamazaki, *Synthesis* **1983** (3), 226–228:

Compounds **7** and **8** should be named 3-anilino-6-methyl-1,4,5,6-tetrahydropyrrolo[2,3-*c*]pyrazoles and 3-anilino-7-methyl-4,5,6,7-tetrahydro-1*H*-pyrazolo[3,4-*b*]pyridines, respectively.

F. Babudri, L. Di Nunno, S. Florio, *Synthesis* **1983** (3), 230–231:

The title compounds **5** and **7** should be named (*Z*)-2-alkylidene-4-methyl-3-oxo-2,3-dihydro-4*H*-1,4-benzothiazines; compound **10** as 11-methyl-3-(2-methylaminophenylthio)-2-oxo-4,5-diphenyl-2,5-dihydro-11*H*-oxepino[3,2-*b*][1,4]benzothiazine.

Y. Kurasawa, Y. Moritaki, A. Takada, *Synthesis* **1983** (3), 238–240:

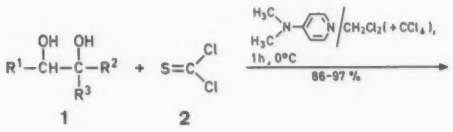
The title compounds **6** and **7** should be named 3-(1-ethoxyalkylidenehydrazinocarbonylmethylene)-2-oxo-1,2,3,4-tetrahydroquinoxalines and 3-(1,3,4-oxadiazol-2-ylmethylene)-2-oxo-1,2,3,4-tetrahydroquinoxalines, respectively.

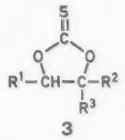
Abstract **6589**, *Synthesis* **1983** (3), 247:

The title should be *N*-(1-Aroyloxyalkyl)-pyridinium and *P*-(1-Aroyloxyalkyl)-phosphonium Salts.

Abstract **6593**, *Synthesis* **1983** (4), 335:

The formula scheme **1** + **2** ⟶ **3** should be:



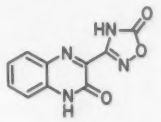


Y. Otsuji, S. Nakanishi, N. Ohmura, K. Mizuno, *Synthesis* **1983** (5), 390:

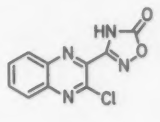
The substituents for compound **2g** (Table) should be R=H, X=H, n=1.

Y. Kurasawa, M. Ichikawa, A. Sakakura, A. Takada, *Synthesis* **1983** (5), 399–400:

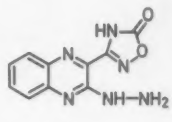
The structures of products **4**, **8**, **9**, and **10** given have since been found to be erroneous, the corrected structures are given below. A revision will be published in *Chem. Pharm. Bull.* in 1984.



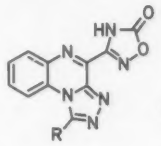
4



8



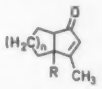
9



10a R = H
b R = CH_3

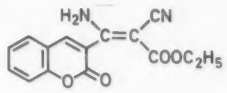
C. Santelli-Rouvier, M. Santelli, *Synthesis* **1983** (6), 429–442:

The structure of the third product in Table 4 (p. 435) should be:



S. M. Fahmy, R. M. Mohareb, *Synthesis* **1983** (6), 478–480:

The structure of product **5** should be:



L. Jacob, M. Julia, B. Pfeiffer, C. Rolando, *Synthesis* **1983** (6), 451–452:

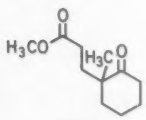
The first three entries in Table 1 (p. 451) should be as follows:

Table 1. Demethylation of Mixed Alkyl Methyl Phosphates (**1, 3, 4**) and of Dimethyl Heptanephosphonate (**5**) using Dimethyl Sulfide (2.5 equiv) and Methanesulfonic Acid (10 equiv)

Substrate	Product	Reaction conditions		Yield[a] [%]	m.p. [°C][b] (solvent)	Molecular formula[c] or m.p. [°C] reported
		Scale [mmol]	Time [h]			
1a $n\text{-}C_6H_{13}\text{–O–P(O)(OCH}_3\text{)}_2$	**2a** · $H_2N\text{–}C_6H_5$	10	22	82 (93)	133–134° (ethanol)	$C_{12}H_{22}NO_4P$ (275.3)
1b $n\text{-}C_8H_{17}\text{–O–P(O)(OCH}_3\text{)}_2$	**2b** · $H_2N\text{–}C_6H_5$	5	7	(88)	135–137° (acetone)	129–130°[22] (ethanol)
		5	12	(93)		
		5	48	(98)		
		5	19	65		
		10	92	83		
		10	52[c]	83		
1c $n\text{-}C_6H_{13}\text{–CH(CH}_3\text{)–O–P(O)(OCH}_3\text{)}_2$	**2c** · $H_2N\text{–}C_6H_5$	5	19	68	154° (ethanol)	$C_{14}H_{26}NO_4P$ (303.3)
		10	92	79		

J. K. Whitesell, M. A. Whitesell, *Synthesis* **1983** (7), 517–536:

Compound **14** (p. 521) should be named 3-methoxycarbonylmethyl-8a-methyl-5-methylene-2-oxo-6-(2,2-dimethylpropanoyloxy)-*trans*-decalin. The structure of compound **25** (p. 522) should be:



25

T. Kolasa, *Synthesis* **1983** (7), 539:

The heading for the 6th column in the Table should be (*Z*/*E*)-Ratio.

S. Kano, Y. Yuasa, T. Yokomatsu, S. Shibuya, *Synthesis* **1983** (7), 585–587:

Compounds **5** should be named 3-oxo-2,3,4,5-tetrahydro-1*H*-azepino[4,3-*b*][1]benzothiophenes.

M. Sawada, Y. Furukawa, Y. Takai, T. Hanafusa, *Synthesis* **1983** (7), 593–595:

Compounds **4** and **5** should be named 2,4-dialkyl-1,3,6-trioxo-2,3,4,4a,5,6-hexahydro-1*H*-[1,3,5]triazino[1,2-*a*]quinolines and 1,3-dimethyl-2,4,8-trioxo-1,2,3,4,7,8-hexahydro-8a*H*-pyrido[1,2-*a*][1,3,5]triazine, respectively.

R. B. Cheikh, R. Chaabouni, A. Laurent, P. Mison, A. Nafti, *Synthesis* **1983** (9), 685–700:

The first substrate in Table 3 (p. 689) should be:

Y. Imai, A. Mochizuki, K. Kakimoto, *Synthesis* **1983** (10), 851:

The title compounds **4** should be named 4*H*-1,2,4-benzothiadiazine 1,1-dioxides.

R. Rastogi, S. Sharma, *Synthesis* **1983** (11); 861–882:

Compound **109** (p. 870) should be named: 7,12-dioxo-6,7-dihydro-12*H*-benzimidazo[1,2-*b*][2,4]benzodiazepine.

P. Kutschy, J. Imrich, J. Bernát, *Synthesis* **1983** (11), 929–931:

The title compounds **4** should be named 2-amino-4-oxo-4*H*-[1]benzothieno[2,3-*e*]-1,3-thiazines.

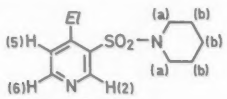
P. Breant, M. Marsais, G. Quéguiner, *Synthesis* **1983** (10), 822–824:

The following data should be added to the ^{1}H-N.M.R. spectra of compounds **3a–c** (p. 824):

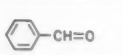
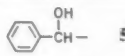
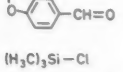
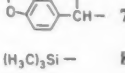
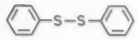
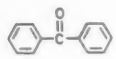
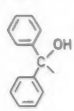
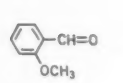
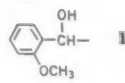
For compounds **3a–c**, $J_{H\text{-}4,H\text{-}5}$ = 8 Hz; $J_{H\text{-}5,H\text{-}6}$ = 5 Hz; $J_{H\text{-}4,H\text{-}6}$ = 2 Hz; $J_{H\text{-}4,H\text{-}2}$ = 2 Hz.

Tables 1 and 2 (p. 823) should be read as follows:

Table 1. 4-Substituted 3-Piperidinosulfonylpyridines prepared



5a, 7a-10a

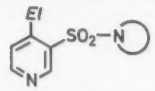
Electrophile	*El*	Product	Yield [%]	m.p. [°C]	Molecular formula[a]	^{1}H-N.M.R. ($CDCl_3$/TMS) δ [ppm][b]
		**5a**	80	127°	$C_{17}H_{18}N_2O_3S$ (330.4)	1.5 [m, 6 H(b)]; 3.1 [m, 4 H(a)]; 4.0 (m, OH); 5.3 (m, 1 H); 6.7 (m, 5 H); 7.53 (d, H-5); 8.63 (d, H-6); 8.93 (s, H-2)
		**7a**	60	80° (dec)	$C_{18}H_{18}N_2O_5S$ (374.4)	1.6 [m, 6 H(b)]; 3.2 [m, 4 H(a)]; 5.96 (s, 2 H); 6.63 (s, 1 H); 6.9 (m, 3 H); 7.50 (d, H-5); 8.86 (d, H-6); 8.93 (s, H-2)
$(H_3C)_3Si-Cl$	$(H_3C)_3Si-$	**8a**	42	<50°	$C_{13}H_{20}N_2O_2SSi$ (296.5)	0.50 (s, 9 H); 1.7 [m, 6 H(b)]; 3.2 [m, 4 H(a)]; 7.70 (d, H-5); 8.70 (d, H-6); 8.95 (s, H-2)
		**9a**	80	82°	$C_{16}H_{16}N_2O_2S_2$ (332.4)	1.7 [m, 6 H(b)]; 3.2 [m, 4 H(a)]; 6.70 (d, H-5); 7.56 (s, 5 H); 8.30 (d, H-6); 8.93 (s, H-2)
		**6a**	95	195°	$C_{23}H_{22}N_2O_3S$ (406.5)	1.5 [m, 6 H(b)]; 3.2 [m, 4 H(a)]; 6.70 (s, OH); 6.75 (d, H-5); 7.30 (s, 10 H); 8.51 (d, H-6); 9.06 (s, H-2)
		**10a**	53	164°	$C_{18}H_{20}N_2O_4S$ (360.4)	1.7 [m, 6 H(b)]; 3.2 [m, 4 H(a)]; 3.70 (s, 3 H); 4.2 (m, OH); 6.70 (s, 1 H); 7.15 (d, H-5); 7.5 (m, 4 H); 8.80 (d, H-6); 9.06 (s, H-2)
–	–	**12**	–	–	–[c]	1.7 [m, 6 H(b)]; 3.3 [m, 4 H(a)]; 4.6 (m, OH); 5.96 (d, 1 H, J = 3 Hz); 7.85 (d, H-5); 8.86 (d, H-6); 9.00 (s, H-2)
–	–	**13**	–	–	–[c]	1.7 [m, 6 H(b)]; 3.3 [m, 4 H(a)]; 5.83 (d, 1 H, J = 3 Hz); 7.60 (d, H-5); 8.83 (d, H-6); 9.13 (s, H-2)

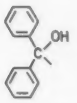
[a] Satisfactory microanalyses obtained: C ±0.38, H ±0.32, N ±0.14; exception: **7**: C −0.70%.

[b] $J_{H\text{-}5,H\text{-}6}$ = 5 Hz for all products.

[c] See text.

Table 2. 4-Substituted 3-Aminosulfonylpyridines prepared



El	Amino group	Product	Yield [%]	m.p. [°C]	Molecular formula[a]	^{1}H-N.M.R. ($CDCl_3$/TMS) δ [ppm][b]
		5c	66	134°	$C_{16}H_{16}N_2O_3S$ (316.2)	1.80 (m, 4 H); 3.08 (t, 4 H, J = 7 Hz); 3.9 (m, OH); 6.60 (s, 1 H); 7.3 (s, 5 H); 7.43 (d, H-5); 8.63 (d, H-6); 8.91 (s, H-2)
		**6b**	88	210°	$C_{22}H_{20}N_2O_4S$ (408.2)	3.05 (t, 4 H, J = 4.5 Hz); 3.66 (t, 4 H, J = 4.5 Hz); 6.55 (s, OH); 6.80 (d, H-5); 7.30 (s, 10 H); 8.60 (d, H-6); 9.15 (s, H-2)
		14	~100	138°	$C_{17}H_{18}N_2O_3S$ (330.2)	1.56 (m, 6 H); 3.15 (m, 4 H); 7.25 (d, H-5); 7.6 (m, 5 H); 8.86 (d, H-6); 9.16 (s, H-2)
		15	~100	130°	$C_{18}H_{18}N_2O_5S$ (374.2)	1.4 (m, 6 H); 3.0 (m, 4 H); 6.13 (s, 2 H); 7.1 (m, 3 H); 7.50 (d, H-5); 8.86 (d, H-6); 9.00 (s, H-2)

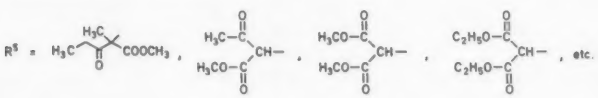
[a] Satisfactory microanalyses obtained: C ±0.44, H ±0.18, N ±0.10.
[b] The pyridine proton coupling constant $J_{H\text{-}5,H\text{-}6}$ = 5 Hz for all products.

R. Grigg, P. J. Stevenson, *Synthesis* **1983** (12), 1009–1010:

Wilkinson's catalyst is $RhCl[P(C_6H_5)_3]_3$.

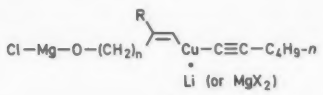
Abstract **6759**, *Synthesis* **1983** (12), 1049:

The substituents R^5 should be:



Abstract **6769**, *Synthesis* **1983** (12), 1052:

The structure of compound **6** should be:



6

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Language of publication is English or, in exceptional cases after consultation with the Editors, German.

The subject matter which might be acceptable is almost unlimited provided that the emphasis is on practical methods in synthetic organic chemistry. The article should give either a complete description of the methods which have not been previously reviewed and/or a critical evaluation of new developments to known methods. The manuscript should be written in the style currently used in SYNTHESIS and should include as many up-to-date, key references as possible.

In addition to the directions given in Section III, the following points should be followed during the preparation of manuscripts for review articles:

1. The manuscript should not exceed 40 pages (DIN A 4 or Quarto), including references, formulae, and tables, typed with double spacing (~ 15–20 printed pages). Longer articles may be accepted under exceptional circumstances; however, publication of such articles may be delayed until sufficient space becomes available.
2. The methods described must be illustrated by detailed descriptions of the experimental procedures involved. These examples should preferably be unpublished or be selected from less common sources.
3. Discussion of theory and mechanism should be limited to the minimum necessary for a clear understanding of the reactions under consideration. Historical background should be avoided or restricted to a minimum.
4. Clear reaction schemes (not only individual structures) should be given and tabulation of critically selected analogous results made whenever possible.
5. Each review article must be preceded by a table of contents and a concise abstract reflecting accurately the subject matter.
6. Only in exceptional cases should the author restrict the presentation to his own work.
7. Quotation of authors' names in the text should be avoided.
8. The material contained in previous review articles should be considered and repetitions avoided wherever possible.

No fees are paid to the authors of Reviews nor are page charges levied.

II. Communications

Language of publication is English or German; manuscripts should not exceed 6–8 pages in length; no page charges are levied.

Subject of Manuscripts

Manuscripts dealing with the following topics may be submitted for publication.

1. *New synthetic methods*
   Advantages of the new method over the presently existing methods for the same process should be indicated and the scope and limitations of the new method should be illustrated by several examples.
2. *Significantly improved synthetic methods*
   Advantages of the new development over currently used methods should be clearly demonstrated by parallel experiments under similar conditions.
3. *New and/or significantly improved preparations of key substances*
   Potential applications of the key substances should be demonstrated clearly by literature citations or by practical examples.
4. *New classes of compounds.*

Manuscripts describing syntheses of *new* compounds by *known* methods will not be accepted. In addition, manuscripts may not be accepted if the reactions are only performed on an analytical scale and products are not isolated by a preparative means.

Manuscripts, the essential features of which have previously been published in preliminary form, will not be accepted.

The Editors reserve the right to reject manuscripts which they consider deal with topics of too specialised interest and which would be more suitably published in an appropriate specialist journal.

Content of Manuscripts

Manuscripts must contain:

1. Notation of scope and limitations of the method reported.
2. Clear formula schemes.
3. Detailed experimental procedures.
4. Full preparative, yield, and analytical data.
5. Demonstration of purity and identity of *all products* by suitable analytical methods (with notation of apparatus and conditions).
6. Microanalytical data for *all new compounds.* These data should be submitted separately but will not always be printed.
7. *All new compounds should be clearly indicated as such; Authors are expected to have made a thorough literature search through the latest issue of Chemical Abstracts, etc. For known compounds, comparative physical data from the literature together with the original reference must be given.*

III. Preparation of Manuscripts for Reviews and Communications

1. The manuscript should be typed double spaced on DIN A4 or Quarto paper; identations and underlinings should be avoided (except for complicated cases, as in sugar chemistry, where the type of script to be used may be indicated by underlining). In the case of manuscripts with more than one author, the author to whom correspondence is to be addressed should be indicated (*).
2. The style of articles currently published in SYNTHESIS shoud be followed; tables, procedures, spectral data, formula schemes, references, etc. When the preparation of a series of similar (e.g. homologous) compounds is described, a general procedure should be given and the data for the individual compounds presented in tabular form.
3. The nomenclature used should be based on the systematic rules adopted by *Chemical Abstracts* (Index Guide Vol. 76), *Ring Index* and *Supplements* (American Chemical Society, 1959–1965), IUPAC (*Nomenclature of Organic Chemistry*, Parts A, B & C, Pergamon Press, 1979) etc. Trivial names should be avoided unless they are definitely advantageous over the corresponding systematic names.
4. Whenever possible, clear formulae (reaction schemes are to be preferred to individual structures) should be given for the reaction described. Freehand drawings of organic structures are acceptable. However, it is emphasised that the presentation should be clearly and neatly carried out.
   The following abbreviations should be used in formula schemes:
   - A Groups such as $-(CH_2)_n-$, $-C_6H_4-$, and hetero analogs
   - M Metal
   - R (preferentially) C-Substituents
   - X Halogen, OR, NR_2, SR, etc. (monovalent)
   - Y O, S, NH, etc. (bivalent)

   and the abbreviations used in peptide and sugar chemistry.
   Note: for iodine, the sign J is used. not I.
   In the text, full chemical names should be used instead of formulae whenever possible (e.g. hydrogen chloride or hydrochloric acid, respectively, not HCl). In certain cases, however (e.g. complexes having complicated names) formulae will be accepted.
6. References should be placed collectively at the end of the review article or communication. They should be numbered consecutively. Subdivisions such as 3a, 3b should be avoided. It is requested that the references be checked carefully before the manuscript is submitted. In quotations with more than four authors, only the name of the first author is given with the addition "et al.". Journal abbreviations should be in accord with *Chemical Abstracts* practice (see *Bibliographic Guide for Editors and Authors*, American Chemical Society, 1974).
7. The use of footnotes referring to the text should be avoided if possible. Footnotes should be numbered consecutively with the references throughout the manuscript. Footnotes may be used for tables and should be designated as a, b, c, etc.
8. Acknowledgements may only be made for financial support, essential gifts of chemicals or apparatus, and performance of essential parts of the work (microanalyses, spectra, etc.) by other firms, institutions, etc. The acknowledgements should be kept as brief as possible and placed at the end of the manuscript. Similarly, dedications should be brief and placed at the end of the manuscript.
9. The internationally accepted system of units – "SI-units" – should be used wherever possible.

IV. Submission of Manuscripts

Manuscripts (3 copies are necessary) should be submitted to Prof. Schill or Prof. Sosnovsky. For addresses see inside front of a current issue of SYNTHESIS.

Upon receipt of the manuscript by the Editor, an acknowledgement postcard will be sent. The result of the referees' evaluation will usually follow within 6–8 weeks.

Communications which are accepted for publication will be published as rapidly as is technically possible. It is therefore of interest to readers and authors that all manuscripts be concise and in accord with the directions given here.

Manuscripts written in a language which is not the author's mother language will be checked carefully and corrected where necessary by the editorial staff; this may lead to some delay in publication.

V. Galley Proofs

Galley proofs will be sent to the authors for correction. They should be returned as soon as possible to the editorial office. Please note that the signs XXXXX, 00000, ■■■■■, ?????????, etc. indicate that something was missing or unintelligible in the manuscript and the pertinent information should be added during correction.

It is requested that corrections be limited to the elimination of printing errors. Alterations and expansions are to be avoided for reasons of increased costs. The proof sheets ar not indicative of the quality of the print. This applies particularly to the lay-out of tables. Due to the particular mode of setting, the corrections of misspellings are expediently carried out at the same time as the author's corrections.

Fifty (50) reprints of each article will be supplied free of charge. These will be shipped after publication of the journal issue. An order form for further reprints (in increments of 50) will be sent with the galley proofs and should be signed and returned with the corrected proofs even when additional reprints are not required.